

BROOKHAVEN NATIONAL LABORATORY

MEMORANDUM

DATE: Friday, October 11, 1996

TO: Distribution

FROM: E. Lessard

SUBJECT: Summary of Neutron and Gamma Measurements for FY96

I have summarized the measurements made by J. Preisig for the 1996 proton running period. Neutron quality factor was measured and is shown in column 2 of the attached table; gamma quality factor is taken as unity (1.0). Neutron and gamma dose equivalent rates were also provided by Preisig. I have compared the Preisig results to an estimated chipmunk response. Our practice has been to set the chipmunk with an effective "quality factor" of 2.5 since our radiation monitoring devices respond to a mixed radiation field. It appears that this is an appropriate practice. The dose equivalent rate measured by a chipmunk would be about 50% greater than the dose equivalent measured by examining the neutron field and the gamma field separately in a manner similar to Preisig.

Operationally, the value of effective "quality factor" should be evaluated for HP survey instruments and for interpreting self-reading dosimeters used in mixed radiation fields. Using an effective "quality factor" of 2.5 may be appropriate for these instruments. R. Thern should investigate and follow up on this issue.

If the neutron quality factor is doubled as proposed by International bodies, then the effective "quality factor" of 2.5 is the correct choice for chipmunk measurements at AGS. It is noted that doubling the quality factor for neutrons is only required by the BNL RadCon Manual for design purposes as opposed to operations. On-the-other-hand, leaving the effective "quality factor" for chipmunks at 2.5, in effect, doubles the neutron quality factor for operations. This places us in compliance with potential upward changes to neutron quality factor in the future.

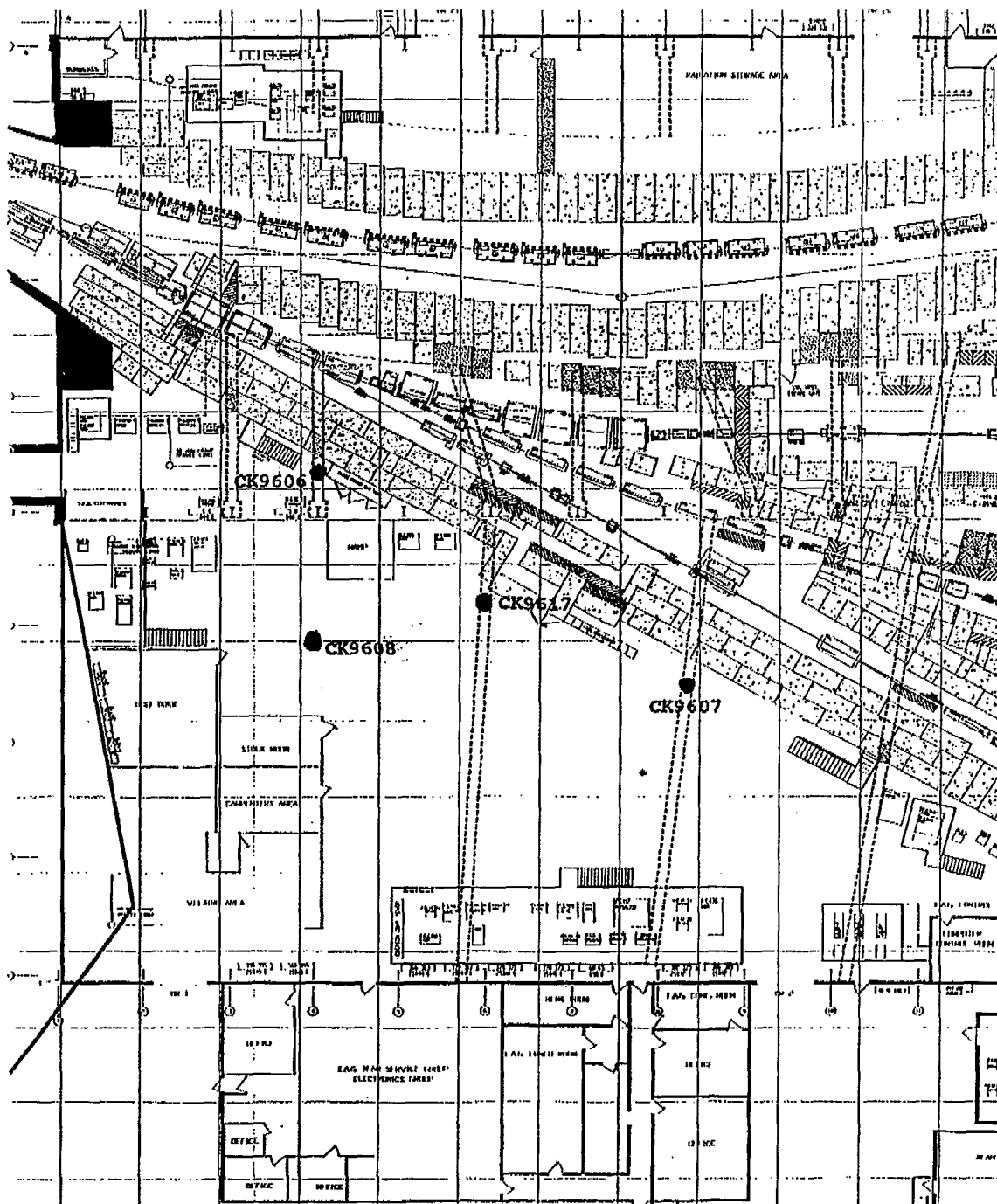
Distribution:

Ahrens, L.
Carroll, A.
Geller, J.
Lowenstein, D.
Pendzick, A.
Pile, P.
Reece, K.
Roser, T.
Thern, R.
Schaefer, C.
Sims, W.

Attachment

1996 Proton Running Period, Bonner Multisphere / RO-2 Gamma Meter Studies Versus
Estimated AGS Chipmunk (Standard-Area-Monitor) Response

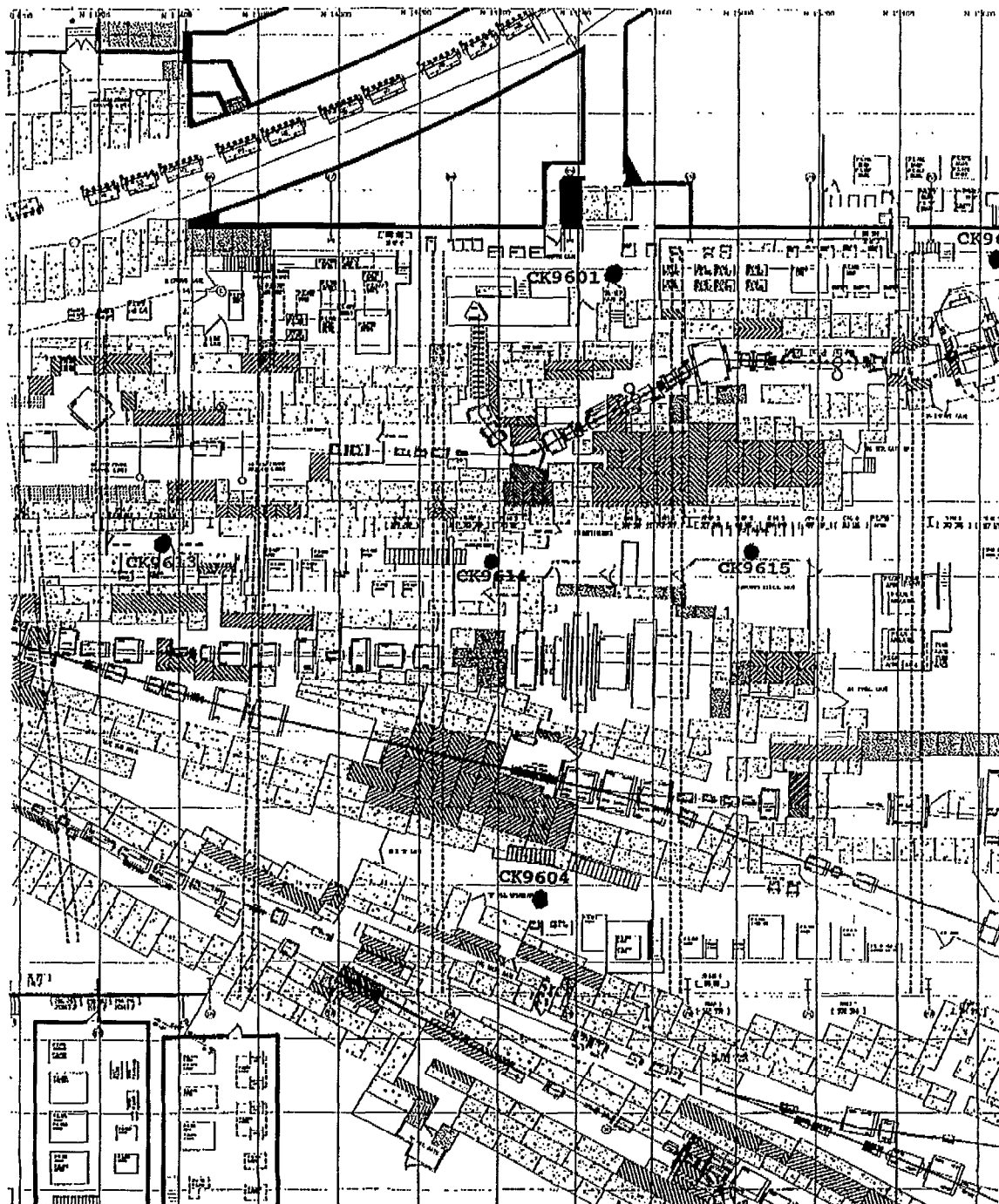
AGS Locator	Neutron Quality Factor	Neutron Dose Equivalent, mrem/h	Photon Dose Equivalent, mrem/h	Total Measured Dose Equivalent mrem/h	Gamma Plus Neutron Estimated Chipmunk Response With Q=2.5 mrem/h	1996 Date	Time	Approximate TP on Target A/B/B5/C/C3/D
CK9601	4.81	0.936	1.77	2.71	4.91	May 8	8:20:33pm	7/15//14/16/5/2
CK9602	5.90	0.109	1.37	1.48	3.47	May 9	8:40:10pm	7/14/13/16/5/6
CK9603	5.38	0.657	2.33	2.99	6.13	May 10	9:35:25pm	4/13/12/17/0/3
CK9604	5.13	0.574	0.60	1.17	1.78	May 13	1:41:30pm	8/16/15/16/6/5
CK9605	4.53	0.542	0.33	0.87	1.12	May 16	8:05:40pm	7/15/13/15/5/5
CK9606	5.97	1.65	4.07	5.72	10.9	May 17	8:43:45pm	8/14/13/15/5/6
CK9607	5.96	5.73	2.03	7.76	7.48	May 21	7:35:35pm	7/12/10/9/0/4
CK9608	6.76	2.19	1.43	3.62	4.38	May 22	8:00:55pm	9/17/15/13/0/6
CK9609	5.80	0.816	0.40	1.22	1.35	May 24	8:03:00pm	7/14/13/16/4/5
CK9610	5.78	0.869	0.50	1.37	1.63	May 29	8:07:05pm	7/15/14/16/6/6
CK9611	6.62	1.68	13.67	15.35	34.8	May 31	8:29:20pm	8/12/11/11/4/6
CK9612	6.16	6.80	3.90	10.70	11.4	June 4	7:43:35pm	2/6/6/8/2/0
CK9613	4.22	6.97	3.47	10.44	12.8	June 6	8:32:10pm	5/14/12/17/4/4
CK9614	5.46	0.848	0.43	1.28	1.46	June 7	8:10:30pm	8/17/15/0/0/0
CK9615	5.46	0.264	0.23	0.49	0.70	June 10	7:52:55pm	no data
CK9616	5.96	0.196	1.03	1.23	3.58	June 11	9:47:30pm	0/12/10/10/0/0
CK9617	6.13	1.03	1.40	2.43	3.92	June 13	8:23:05pm	8/19/16/19/5/0
CK9618	5.68	1.45	1.00	2.45	3.14	June 14	8:16:25pm	7/1/0/19/0/0
CK9619	5.97	0.634	0.37	1.00	1.19	June 17	10:04:20pm	7/15/13/16/0/5
CK9620	5.58	2.64	0.82	3.46	3.23	June 20	8:58:50pm	0/9/8/6/0/0
CK9621	4.84	0.508	0.23	0.74	0.84	June 24	8:32:55pm	8/17/15/15/0/6
CK9622	5.70	0.144	0.20	0.34	0.56	June 26	8:06:50pm	6/1/1/29/0/4
Mean	5.63	1.69	1.89	3.58	5.49			



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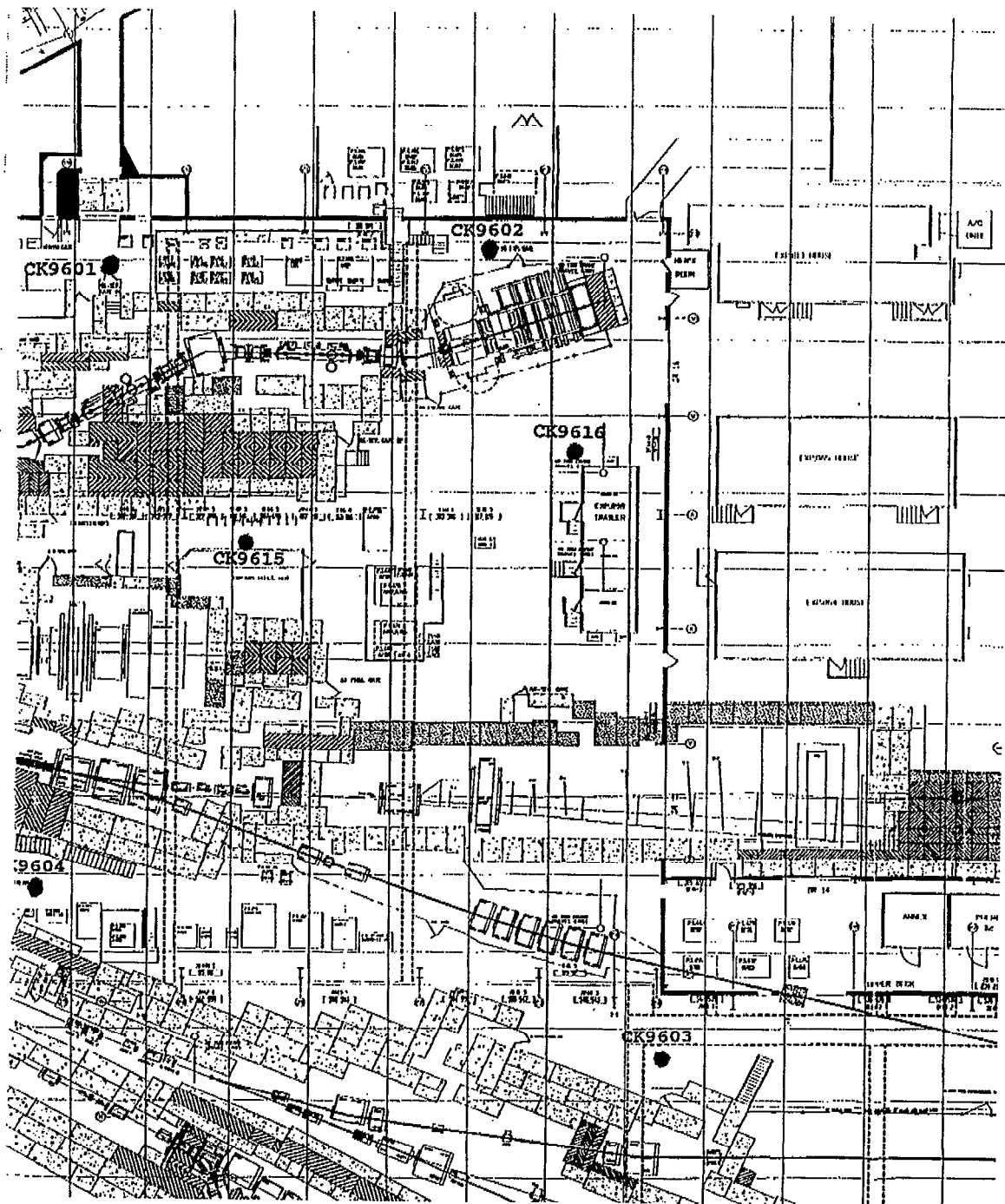
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SEP 23, 1996 2:20PM P.03

TO:4250

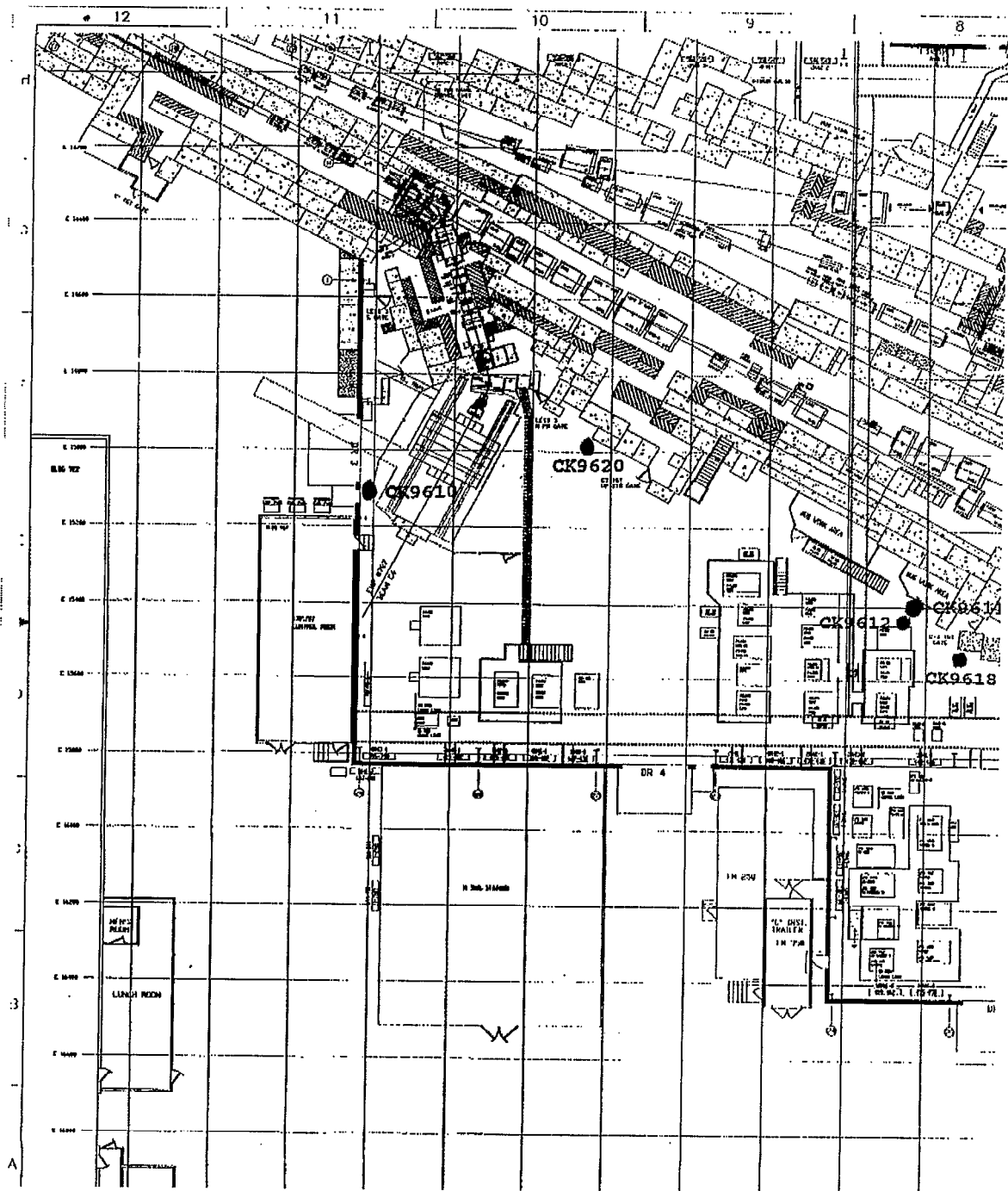
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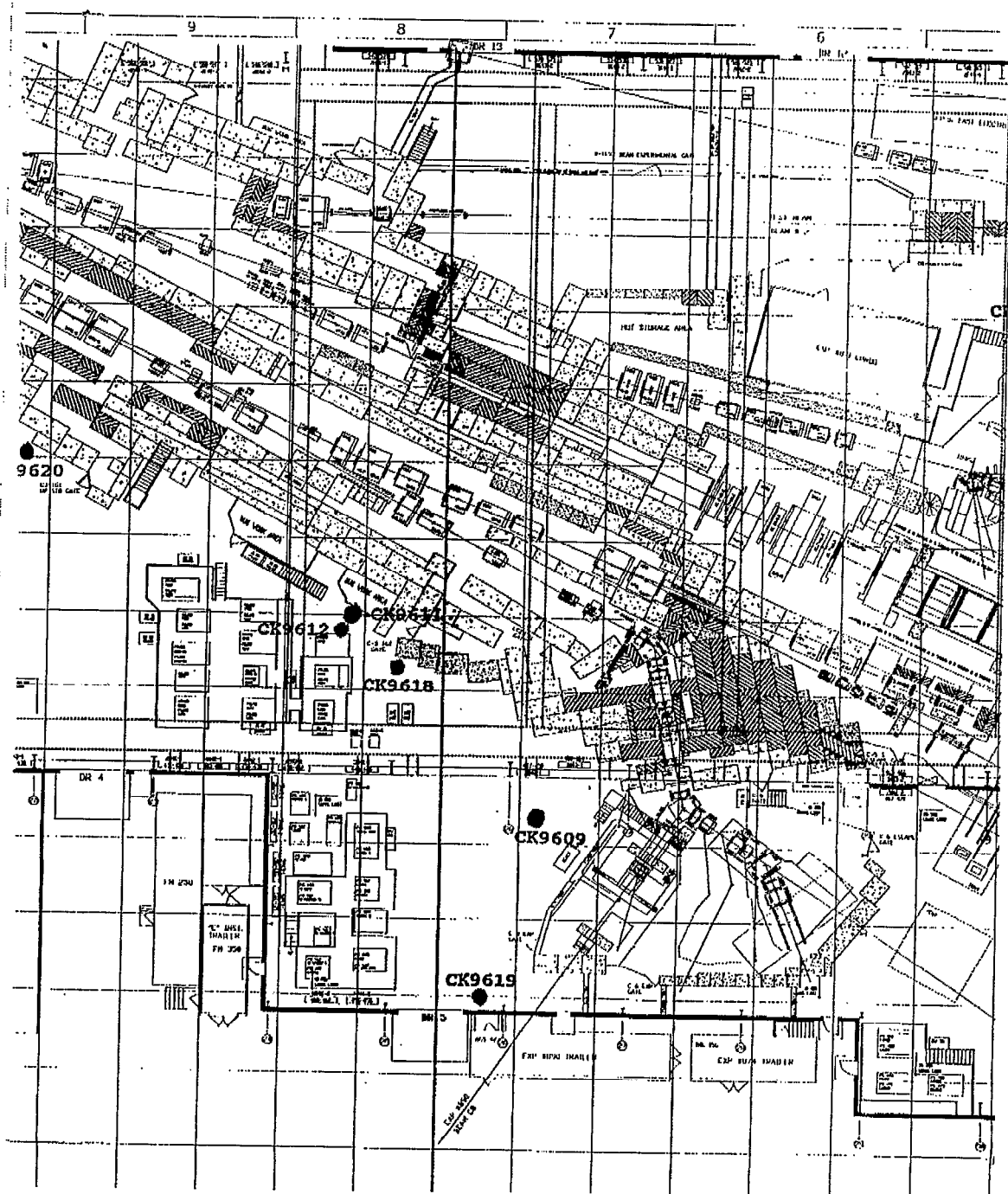
FROM:KONICA FAX



SEP 23, 1996 2:22PM P.05

TO:4250

FROM:KONICA FAX



SEP 23, 1996 2:23PM P.06

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